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ABSTRACT

This document includes the September 1978 Population Education Newsletter and a module containing background information, data sheets, and tips to help teachers develop a one or two hour lesson on population density and mobility in the United States. The module, which comprises the bulk of the document, is intended to encourage high school and college students to clarify their concepts of density, analyze changing migration patterns, consider the role of agriculture in an urban society, and plan for the future in a more populated society. Teaching procedure is outlined in a step-by-step manner, although it is stressed that steps may be followed selectively, depending upon which data sheets are used. Discussion questions are suggested, where appropriate. Examples are, "What accounts for the wide variation in population density between various states?" "Do you think the land needed for urban living will increase in the future as the population grows?" Students are involved in activities including filling in questionnaires, interpreting charts, maps, and graphs, and completing work sheets. The data sheets focus on population density in the United States as a whole and state by state, land use in the United States in various years and regions, population and area of foreign countries, migration by regions in the United States during selected years, and possible future distribution of the United States population. The newsletter focuses on U.S. land use and suggests land use teaching aids. It also offers population news items and announces new population materials. (DB)

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teaching module

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Population Density and Mobility in the United States

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No. 5

INTERCHANGE and TEACHING MODULE series

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This module is designed to be used for teaching purposes. Hence it is *not* necessary for teachers or other group leaders to obtain permission to reproduce for class use the handouts and data sheets included here.

Population Density and Mobility in the United States

by Leon F. Bouvier

Grade Level High School and College

Time Needed One hour (if discussion is limited); Two hours with extended discussions

Materials Copies of questionnaires (Data Sheets 1, 6, and 11) for each student

Goal To encourage students to: clarify their concepts of density; analyze changing migration patterns; consider the role of agriculture in an urban society; plan for their future habitat in a more populated society

Objectives By completing the Data Sheets in this Module, students should be able to:

- Understand population density measures
- Interpret demographic charts
- Better understand the difference between rural and urban density
- Draw conclusions about ideal residential areas
- Understand the relationship between agriculture and population growth

Procedure The following procedure is based on the use of all the Data Sheets in the Module. It is not necessary, of course, to use every Data Sheet

1. Ask each student to complete the "Population Density Questionnaire" (Data Sheet 1).

2. Present Data Sheet 2 showing population densities of the 50 states and have the students calculate the population density per square mile for each of the U.S. regions. Then you might ask: "How do these facts agree or disagree with your own replies?" Ask the students to interpret the chart on state density. Then you might ask: "What accounts for the wide variation in population density between New Jersey and Rhode Island on one hand and Alaska and Wyoming on the other?"

   This leads to a discussion regarding land use for agriculture as opposed to land use for cities.

3. Present Data Sheet 3 showing U.S. land use and ask students what proportion of all the land in the U.S. is devoted to urban use. Then you might ask: "Do you think the land needed for urban living will increase in the future as the population grows?"

   This leads to a discussion regarding differences in land use between rural and urban areas.

4. Present Data Sheet 4 showing population and area of 20 countries and have students calculate the density rates and then discuss the differences between nations. You might ask: "How do these facts compare with your replies to Question 8-9 in the Questionnaire?" "The Netherlands has a density of about 1,000 people per square mile. How can a country like that support such a dense population?"

   This leads to a discussion of imports and exports of foods and other resources.

   Special Teacher Aid: For a discussion of what is called the "Netherlands Fallacy" see G. Tyler Miller, Jr., *Living in the Environment,* (Wadsworth, 1975): "The actual area used to support the population of the Netherlands . . . is not measured by its own land areas. It uses land and resources over the entire globe. The Netherlands must import 63 percent of her cereals and is the world's second largest per capita importer of protein. She imports 57 percent of her other key materials. This means that her 'effective population density' is much less than 960 persons per square mile." (p. 186)

   You might also want to refer to P. Ehrlich and J. Holdren, "Impact of Population Growth," *Science,* 1971, *171,* 1212-1217.

5. Before presenting Data Sheet 5 showing densities of 14 selected countries, ask the students: "In some of these countries, how much land do you think is arable and how much is uninhabitable?" (Be certain that you select countries that are included in Data Sheet 5!) Then present Data Sheet 5 and ask the students: "What types of land are habitable and what types are not?"

   This leads to a discussion of what makes land habitable and how overall density rates can be misleading.

   Special Teacher Aid: While not related to this topic, Data Sheet 5 uses square kilometers while Data Sheet 4 uses square miles. If you wish, you might have the students convert from one measure to the other and give them practice with the metric system. Note that 1 sq. km. = 0.3861 sq. miles; 1 sq. mile = 2.59 sq. km.

6. Ask each student to complete the "Movement of Americans Questionnaire" (Data Sheet 6).

7. Before presenting Data Sheet 7, you should explain how migration rates are calculated and you might also want to explain the meaning of certain U.S. Bureau of the Census terms.

   Net Migration Rate: Simply subtract the number of out-migrants from the number of in-migrants and divide by the total population in the base year; then multiply by 1,000. Thus:

$$\frac{\text{In-migrants} - \text{Out-migrants}}{\text{Total population}} \times 1{,}000 = \text{Net migration rate}$$

   Metropolitan Areas are all those areas in the U.S. that are included in Standard Metropolitan Statistical Areas (SMSAs), an official designation of the U.S. Office of Management and Budget. Non-metropolitan areas include the balance of the nation's area.

   SMSA is defined as an area containing at least one city (or twin cities) of 50,000 or more population, the county in which it is located, and any adjacent counties that are both metropolitan in character and socially and economically integrated with the central city.

SMSAs consist of two parts: the central city or cities and the suburbs, sometimes called the rings.

An urban area in the U.S. includes incorporated and unincorporated places of 2,500 or more inhabitants, plus the urbanized zones around cities of 50,000 or more inhabitants. All other areas are designated as rural.

(For further definitions and information on demographic terms, see the new *Population Handbook*, published by the Population Reference Bureau.)

8. Present Data Sheets 7 and 8, showing U.S. migration trends by region and by state. Have students determine which regions have the highest amount (i.e., numbers) of in- and out-migration. Have students determine which states have the highest and lowest rates of net migration. (A number of states have net out-migration. Be certain that the students distinguish between net in- and net out-migration.)

This leads to a discussion of what makes people move from certain regions and states to other regions and states.

Special Teacher Aid: You might want to introduce the concepts of "push" and "pull" at this time. For an interesting discussion of these concepts, see Everett S. Lee, "A Theory of Migration," *Demography*, 1966, 3(1), 47-57: "In every area there are countless factors which act to hold people to it, and there are others which tend to repel them. . . . There are others . . . to which people are essentially indifferent. Some of these factors affect most people in much the same way, while others affect different people in different ways. Thus a good climate is attractive and a bad climate is repulsive to nearly everyone; but a good school system may be counted as a plus by a parent with young children and a minus by a homeowner with no children because of the high real estate taxes engendered, while an unmarried male without taxable property is indifferent to the situation." (p. 50)

After discussing the "push" and the "pull" concepts, you might ask the students: "What are some of the factors that might induce people to move into this state or region?" "What are some of the factors that might induce people to leave this state or region?"

9. Present Data Sheet 9 showing U.S. population mobility and ask students to explain what this chart means. You might ask them: "Do most people move within or between states?" "Do most people move within a county or between counties?" (A migrant crosses a county line; a mover simply changes residence. A migrant is a mover; a mover is not necessarily a migrant.)

10. Take a count of the replies to Question 4 on Data Sheet 6. Place the results on the board so that all the students can see their answers. Then present Data Sheet 10 showing populations inside and outside SMSAs and ask the students to compare the actual situation with their own answers. You might then ask: "In what ways are the large cities losing population—through natural decrease (more deaths than births) or through net out-migration?" (Most cities lose population through out-migration. However, because city populations are getting older, births do not exceed deaths by very much. In some large older cities, deaths among whites do exceed births.)

    You might also ask: "Why are the large cities losing population?" "What are some of the effects of the loss of population on the cities themselves?" "Do you think our suburbs in this area will continue to grow?" "Why do you suppose people are now moving to the non-metropolitan areas?"

This leads to a discussion of where people now prefer to live and why.

11. Ask each student to complete the "Future Distribution of the U.S. Population Questionnaire." (Data Sheet 11). As these are all 'opinion' questions, try to arrive at the consensus of the class and discuss each question separately.

12. Present Data Sheet 12 showing the largest U.S. SMSAs and cities and ask the students: "How do the rankings of large cities and SMSAs compare with your predictions for the year 2000?" "How large do you think the number one city will be in the year 2000?" What about the largest SMSA?

13. Present Data Sheet 13 showing a map of present and future urban areas (preferably on an overhead transparency) and simply ask: "Do you think that the U.S. population distribution will look like this in the year 2000?"

    This leads to a discussion of where the next 40 to 50 million Americans will live.

Data Sheet Sources: 1. Population Reference Bureau; 2. *1970 Census of Population: Number of Inhabitants*, final report PC(1)-A1, U.S. Bureau of the Census, 1971; 3. U.S. Department of Agriculture; 4. PRB; 5. PRB Chart Series, 1976; 6. PRB; 7. *Current Population Reports*, P-20. No. 785; 8. PRB Chart Series, 1976; 9. *Current Population Reports*, P-20, No. 235, updated; 10. *1970 Census of Population: Number of Inhabitants*, op. cit.; 11. PRB; 12. *Statistical Abstract of the United States, 1976*, U.S. Government Printing Office; 13. Adapted from Jerome P. Pickard, *Dimensions of Metropolitanism*, Urban Land Institute, 1967, and PRB.

Population Density

Questionnaire

Please answer the following questions as best you can. Some are opinion questions; others are factual; all will be discussed later in this exercise.

1. Density refers to the number of people who live in a specified size area. For example, one square mile (i.e. 1 mile x 1 mile), or one acre (i.e. 4,840 sq. yards or approximately one football field). What would you say was the highest realistic number of people who could live on one square mile of land?

   _____

2. What do you think is the population density of the U.S.? That is, on the average, how many people live on one square mile of land? _____

3. The U.S. is divided into four major regions: Northeast, South, North Central, West. How would you rank these according to population density?

   1._____ 2._____ 3._____ 4._____

4. What do you think are the three most densely populated states; the three least densely populated?

Most Densely Populated	Least Densely Populated
1._____	1._____
2._____	2._____
3._____	3._____

5. Most Americans live in urban areas? What proportions of all the U.S. land do you think is used for urban living?_____

6. How much of the U.S. land do you think is used for agriculture; that is, for growing crops and for feeding and grazing for animals? _____

(continued)

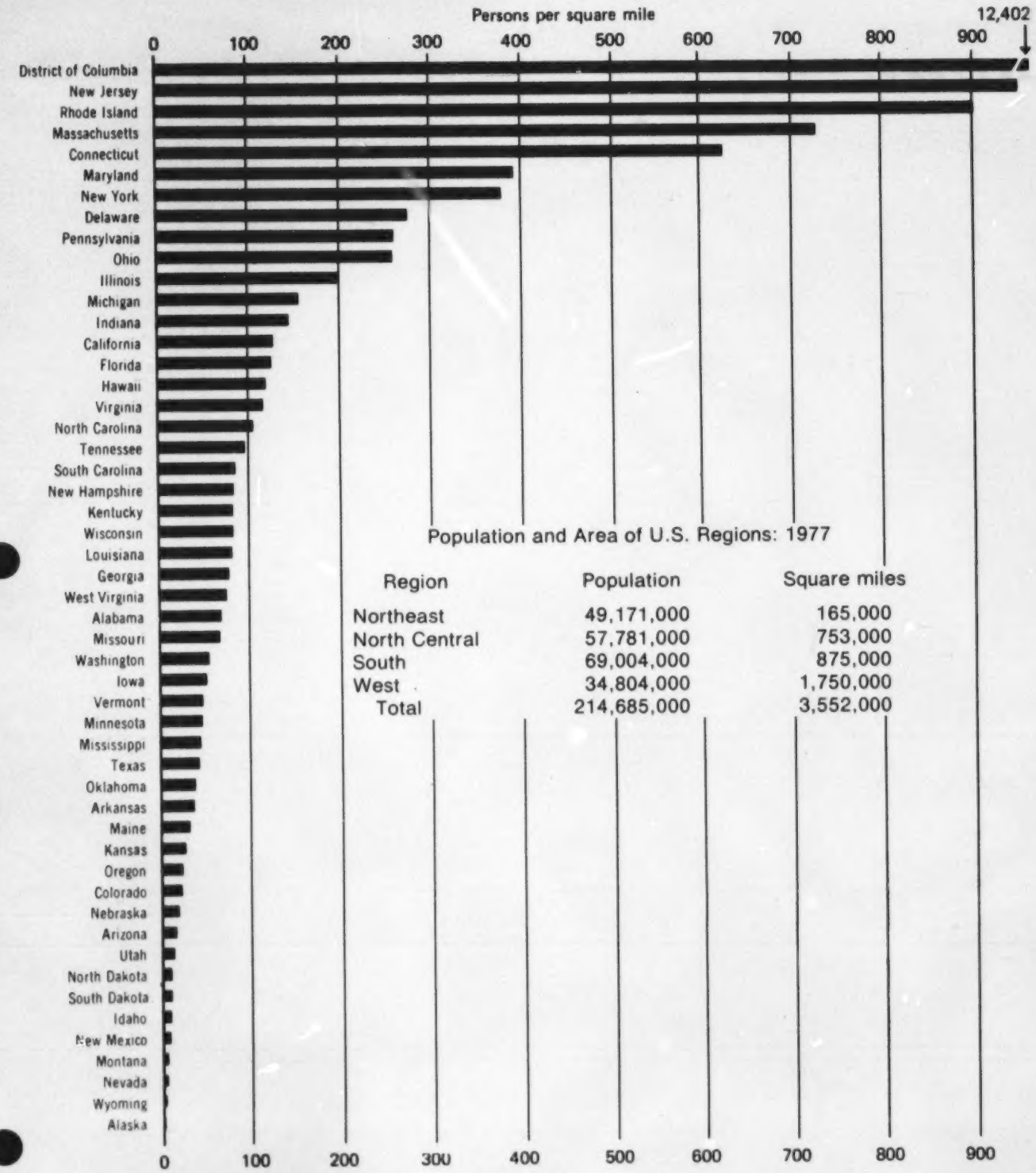
7. How many more people can an urban sq. mile support than a rural sq. mile? _____

8. In your opinion, of the fifty largest countries in the world, what are the three most densely populated? the three least densely populated?

Most Densely Populated	Least Densely Populated
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

9. If you had your choice, how many people would live in the sq. mile of land in which your home is located? _____

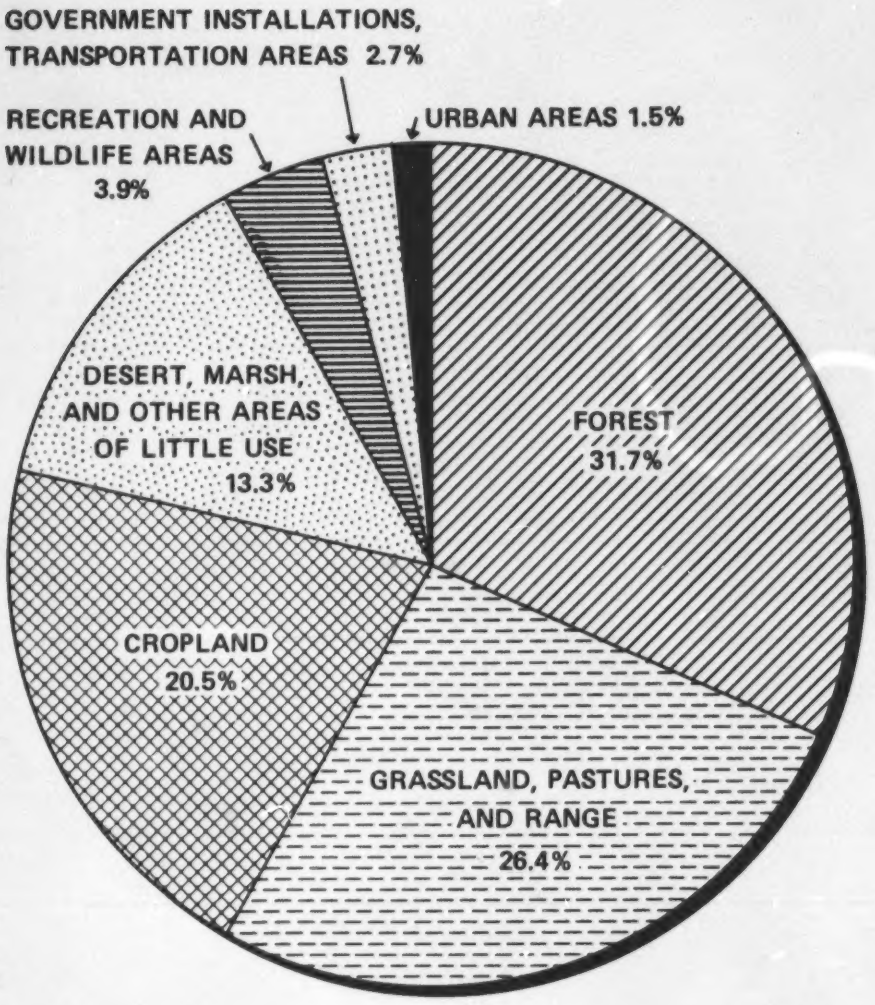
States Ranked by Population Density



Population and Area of U.S. Regions: 1977

Region	Population	Square miles
Northeast	49,171,000	165,000
North Central	57,781,000	753,000
South	69,004,000	875,000
West	34,804,000	1,750,000
Total	214,685,000	3,552,000

U.S. LAND USE: 1975


GOVERNMENT INSTALLATIONS, TRANSPORTATION AREAS 2.7%
RECREATION AND WILDLIFE AREAS 3.9%
URBAN AREAS 1.5%
DESERT, MARSH, AND OTHER AREAS OF LITTLE USE 13.3%
FOREST 31.7%
CROPLAND 20.5%
GRASSLAND, PASTURES, AND RANGE 26.4%

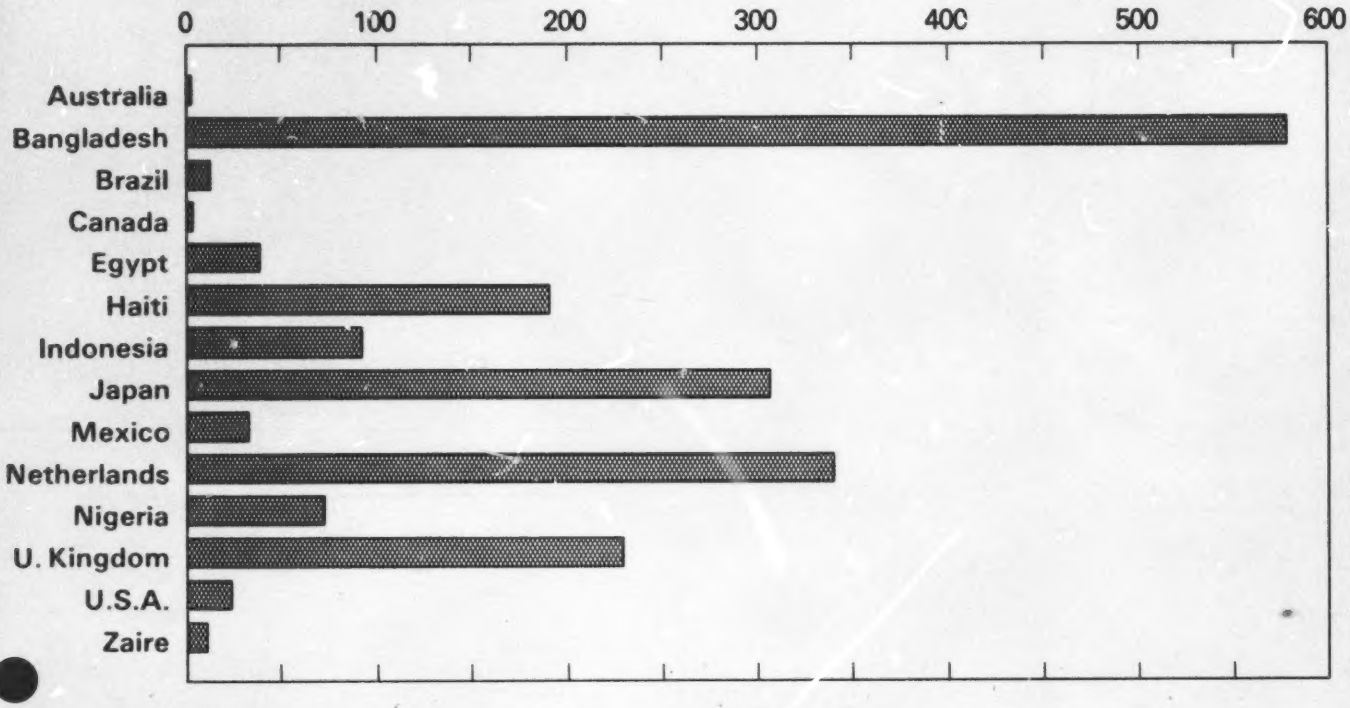
Population and Area of 20 Largest Countries

Rank	Country	Population	Land area (sq. miles)	Density*
1	People's Rep. of China	930,000,000	3,691,500	_____
2	India	634,700,000	1,226,466	_____
3	USSR	261,300,000	8,600,350	_____
4	United States	218,400,000	3,675,545	_____
5	Indonesia	140,200,000	735,268	_____
6	Brazil	115,400,000	3,286,487	_____
7	Japan	114,400,000	143,722	_____
8	Bangladesh	85,000,000	55,126	_____
9	Pakistan	76,800,000	345,753	_____
10	Nigeria	68,400,000	356,669	_____
11	Mexico	66,900,000	761,604	_____
12	Fed. Rep. of Germany	61,300,000	96,062	_____
13	Italy	56,700,000	116,313	_____
14	United Kingdom	56,000,000	94,214	_____
15	France	53,400,000	212,750	_____
16	Vietnam	49,200,000	128,402	_____
17	Philippines	46,300,000	115,831	_____
18	Thailand	45,100,000	198,500	_____
19	Turkey	42,200,000	301,382	_____
20	Egypt	39,600,000	386,900	_____

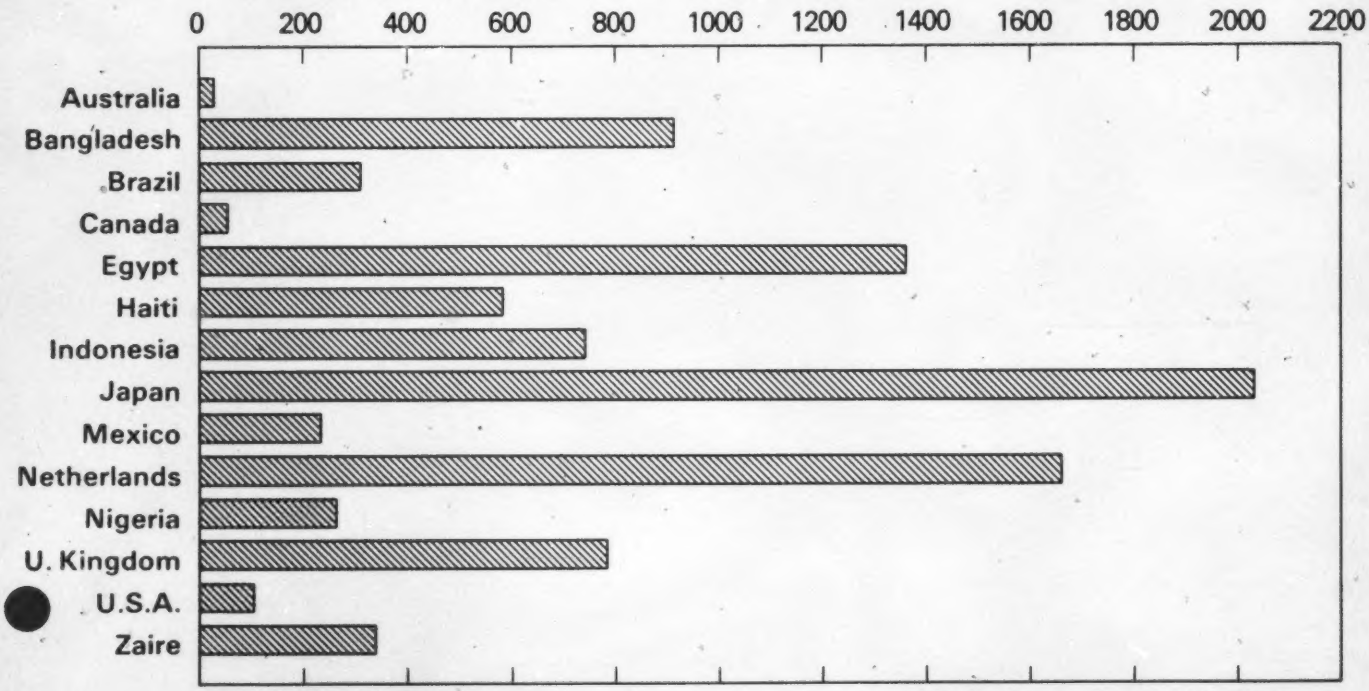
*To calculate density, divide: $\frac{\text{Population}}{\text{Land area}}$

Population Density in 14 Selected Countries

Population per Sq. Kilometer[1] of Land Area, 1977 Estimates



Population per Sq. Kilometer of Arable Land,[2] 1977 Estimates



[1] 1 sq. km. = 0.3861 sq. mi.; 1 sq. mi. = 2.59 sq. km.
[2] Note use of different scale.

The Movement of Americans

Questionnaire

Please answer the following questions to the best of your ability. The correct answers will be given later in the exercise.

1. Changing density results from both natural increase or decrease (i.e., births minus deaths) and from net migration. Which of the four regions of the U.S. (Northeast, South, North Central, West) had the greatest in-migration between 1970 and 1975?_____ Which had the greatest out-migration? _____

2. Which three states had the highest rate of net in-migration since 1970? Which three states had the highest rate of net out-migration?

In-migration	Out-migration
1._____	1._____
2._____	2._____
3._____	3._____

3. About what proportion of Americans move every year?_____

4. Where are Americans most likely to live today? (Rank in order.)

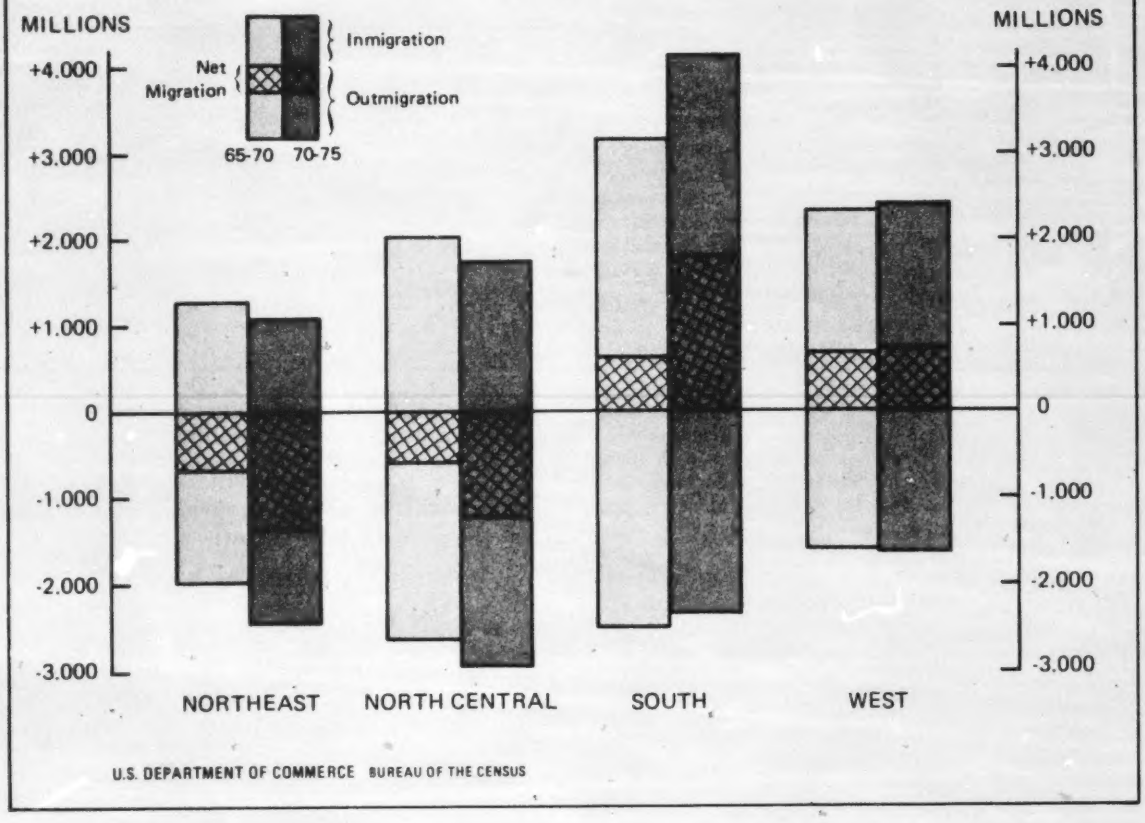
   _____ in central cities; _____ in suburbs; _____ in non-metropolitan areas.

5. Where were they most likely to live in 1960? (Rank in order.)

   _____ in central cities; _____ in suburbs; _____ in non-metropolitan areas.

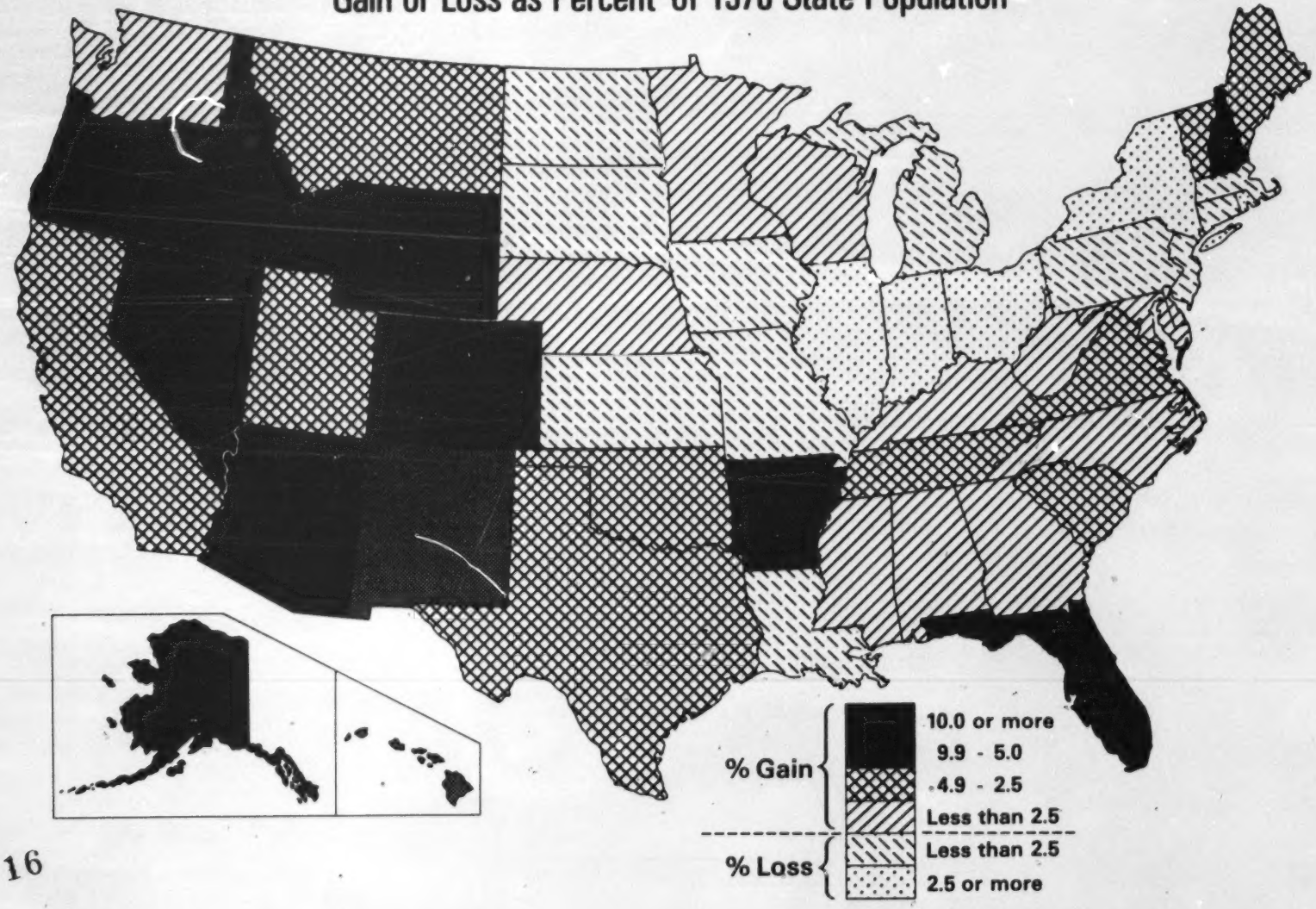
U.S. Migration by Regions: 1965-1970 and 1970-1975

Figure 2. Inmigration, Outmigration, and Net Migration for Regions: 1965-70 and 1970-75



Migration Trends in the United States, 1970-1976

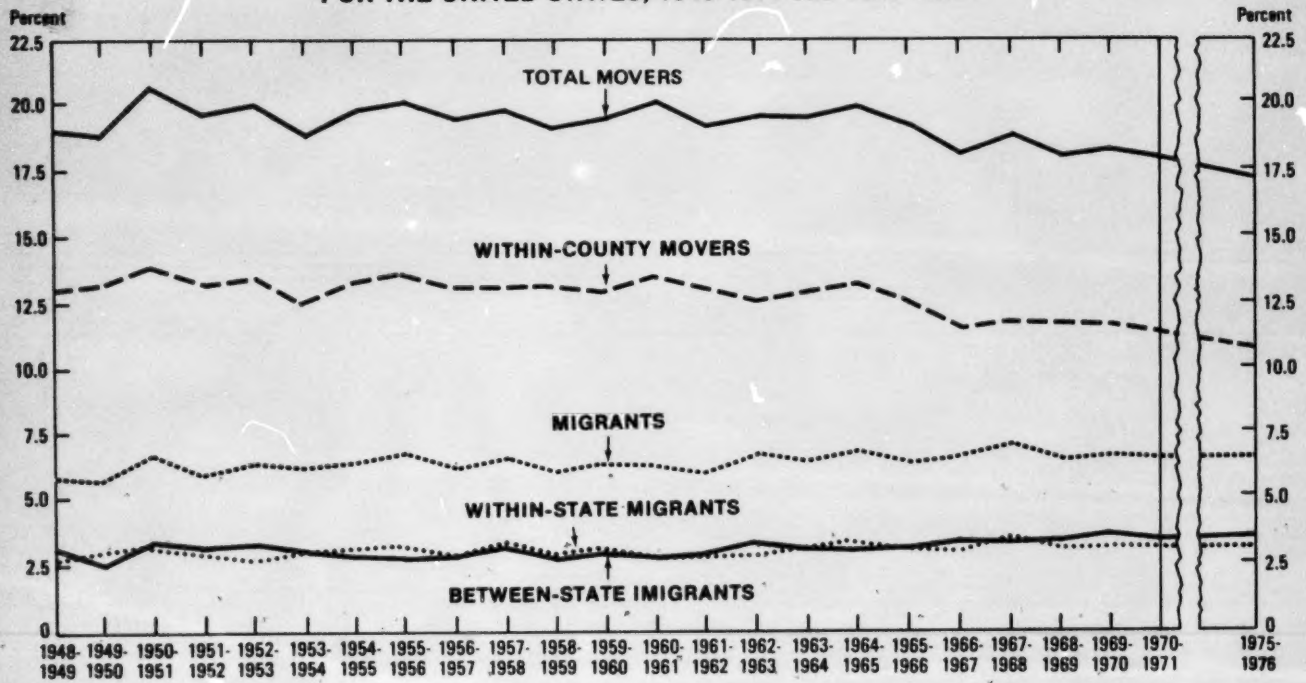
Gain or Loss as Percent of 1970 State Population



Data Sheet 9

Movers by Type of Mobility

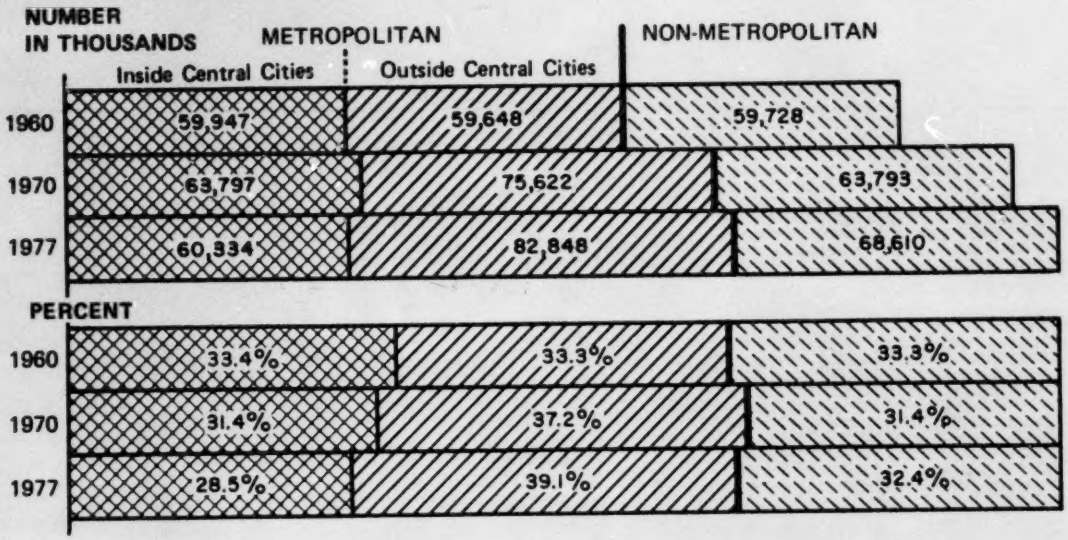
AS PERCENT OF THE POPULATION 1 YEAR OLD AND OVER, FOR THE UNITED STATES, 1948-1971 and 1975-1976



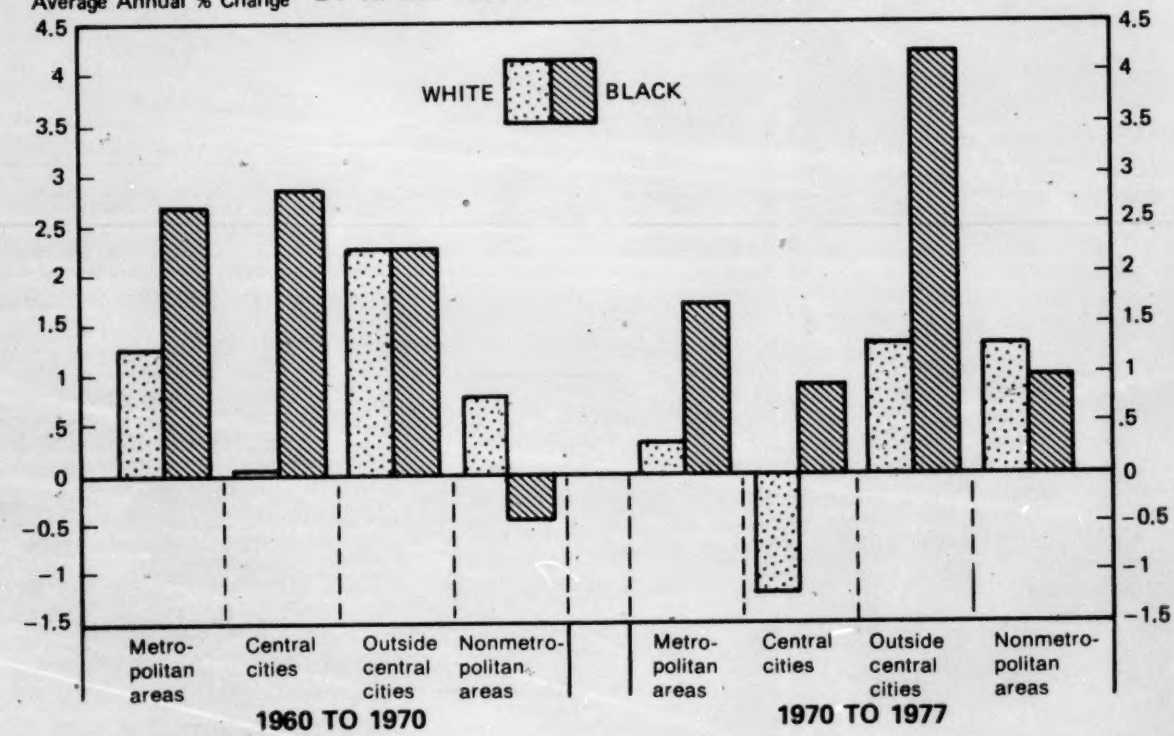
Population in U.S. Urban Areas

Data Sheet 10

POPULATION INSIDE AND OUTSIDE SMSA'S*: 1960, 1970 AND 1977



POPULATION CHANGE IN METROPOLITAN AND NONMETROPOLITAN AREAS BY RACE: 1960 TO 1970 and 1970 TO 1977



*SMSA = Standard Metropolitan Statistical Area. An SMSA is a metropolitan area, defined (by the U.S. Government) as containing at least one city (or twin cities) of 50,000 or more population, the county in which it is located, and any adjacent counties that are both metropolitan in character and socially and economically integrated with the central city.

Future Distribution of the U.S. Population

Questionnaire

Please answer the following questions as best you can. Note that there are no correct answers. Just indicate your honest opinion.

1. According to the Census Bureau, there will be about one-third more households in the U.S. in the year 2000 than there are today, and the present population will be at least 30 million greater than at present. Where do you think these additional people will most likely set up their households?

   _____ Central cities; _____ Suburbs; _____ Non-metropolitan areas.

2. In the year 2000, which do you think will be the most populated state?_____ The least populated?_____ The most densely populated? _____ The least densely populated? _____.

3. In the year 2000, what do you think will be the five largest cities? The five largest SMSAs*?

Cities	SMSAs
1._____	1._____
2._____	2._____
3._____	3._____
4._____	4._____
5._____	5._____

4. In the year 2000, what proportion of the U.S. land area do you think will be devoted to agriculture? _____ To urban areas? _____.

5. In what state would you like to live in five years? _____ In the year 2000? _____.

6. Do you think it is appropriate for certain cities to establish limits on the number of people they will allow to move in? Why?

   _____.

*SMSA = Standard Metropolitan Statistical Area. An SMSA is a metropolitan area, defined (by the U.S. Government) as containing at least one city (or twin cities) of 50,000 or more population, the coutny in which it is located, and any adjacent counties that are both metropolitan in character and socially and economically integrated with the central city.

The 10 Largest SMSAs and Central Cities in the U.S.: 1975

10 LARGEST SMSAs* IN THE U.S.

Rank	SMSA	Population	Land area (sq. miles)	Density (divide pop. by area)
1	New York, w/ N.J. suburbs	9,561,000	1,384	_____
2	Chicago	7,015,000	3,719	_____
3	Los Angeles-Long Beach	6,987,000	4,069	_____
4	Philadelphia w/ N.J. suburbs	4,807,000	3,553	_____
5	Detroit	4,424,000	3,916	_____
6	San Francisco-Oakland	3,140,000	2,480	_____
7	Washington, D.C. w/ Md. & Va. suburbs	3,022,000	2,812	_____
8	Boston	2,890,000	1,233	_____
9	Nassau-Suffolk, N.Y.	2,657,000	1,218	_____
10	Dallas-Ft. Worth	2,527,000	8,360	_____

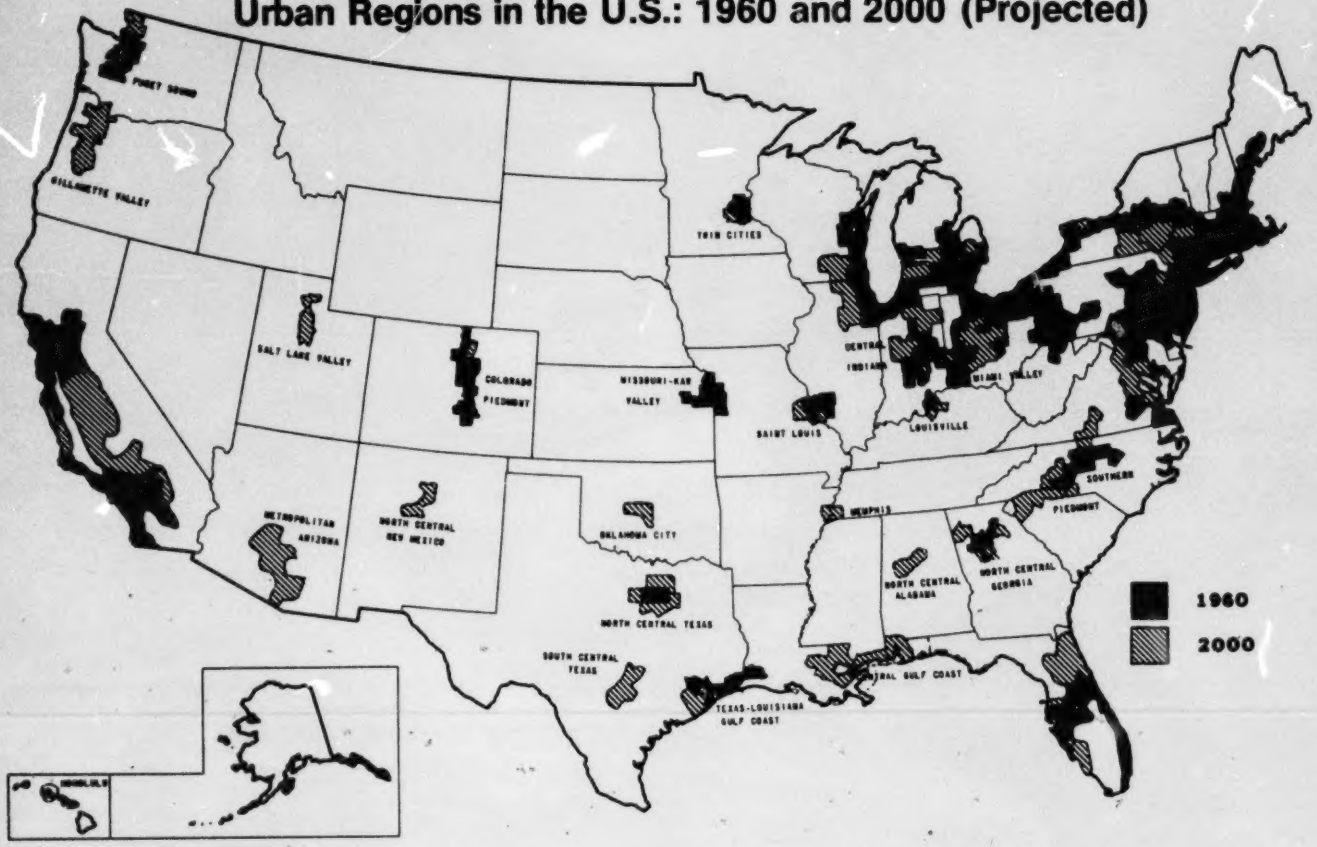
10 LARGEST CENTRAL CITIES

Rank	City	Population	Land area (sq. miles)	Density (divide pop. by area)
1	New York	7,482,000	299.7	_____
2	Chicago	3,099,000	222.6	_____
3	Los Angeles	2,727,000	463.7	_____
4	Philadelphia	1,816,000	128.5	_____
5	Houston	1,357,000	433.9	_____
6	Detroit	1,335,000	138.0	_____
7	Baltimore	852,000	78.3	_____
8	Dallas	813,000	265.6	_____
9	San Diego	774,000	316.9	_____
10	San Antonio	773,000	184.0	_____

*SMSA = Standard Metropolitan Statistical Area. An SMSA is a metropolitan area, defined (by the U.S. Government) as containing at least one city (or twin cities) of 50,000 or more population, the county in which it is located, and any adjacent counties that are both metropolitan in character and socially and economically integrated with the central city.

Data Sheet 13

Urban Regions in the U.S.: 1960 and 2000 (Projected)



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This Land Is Our Land, But . . .

U.S. Land Use: Managing a Finite Resource

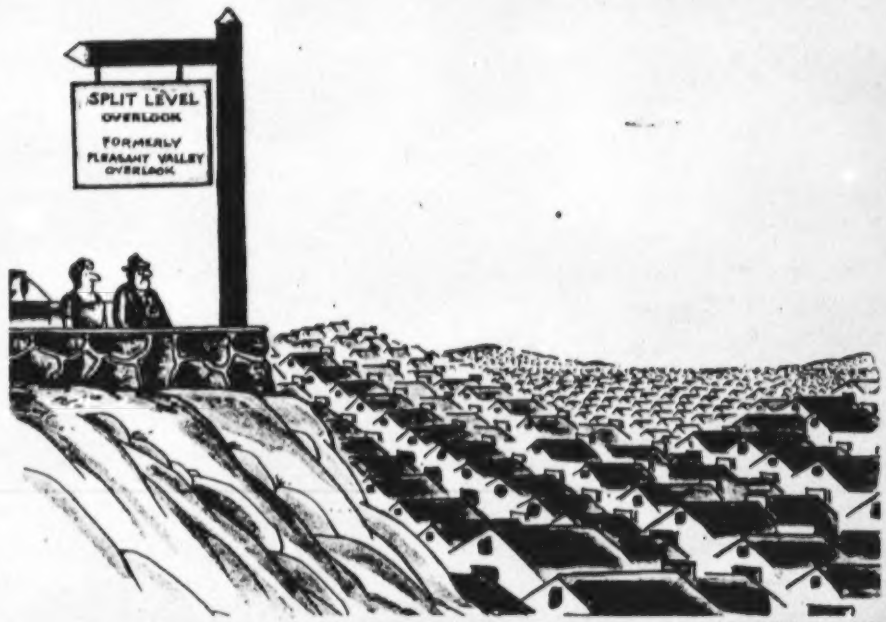
One important source of prosperity for Americans has traditionally been the abundance of land. The institution of private property, established from the beginning of the nation's history, guaranteed that Americans could own land. Coupled with this right was the freedom to move and settle virtually anywhere in the country to pursue a better life.

The history of the settlement and distribution of Americans throughout the country attests to the importance of mobility. The westward settlement of the 1800s, the movement of blacks to northern cities following the Civil War, migrations from rural to urban areas, settlement along coastal regions, suburban development, and most recently the surge of growth in certain non-metropolitan areas are all examples of American mobility. The combination of population growth and mobility has led to wide variations in density. At the signing of the Declaration of Independence there were 4 persons per square mile in what had been the thirteen colonies. Today, population density in the U.S. has increased to about 60 persons per square mile in a country that covers 3,540,939 square miles (2.26 billion acres).

One-fifth of this large land area is classed as cropland; more than one-fourth is used primarily for grazing; nearly one-third is forested; and about one-eighth is unusable land (swamps, deserts, bare rock areas, etc.).

Some 75 percent of Americans live in cities, towns, and suburbs, which occupy only 1.5 percent of the total land area —35 million acres. Land devoted to this strict definition of urban use has almost doubled since 1950. Using a broader definition which encompasses roads and airports and industrial and other areas, close to 4 percent of land area is related to urban uses today.

The overall pattern of land use has remained relatively constant over the past few decades. One half of the nation's land is used for agriculture (i.e., for grazing and cropland). Forests occupy roughly 32 percent.



Drawing by H. Martin; © 1975, The New Yorker Magazine, Inc.

Recent changes in land use represent only minor shifts in terms of the major types of uses; however, the increases within categories, such as the doubling of urban land use, appear dramatic. Recreation and wildlife areas have expanded from about 57 million acres in 1950 to 87 million in 1974. Much of this increase resulted from the reclassification of public forests or wilderness areas and was prompted by the dramatic rise in the public's use of parklands. Between 1950 and 1977 attendance rose by more than 300 percent at State parks and by 690 percent at National parks.

The supply of cropland in the United States has received increasing attention as the demand for food, including exports to other nations, grows. Cropland consists of cultivated, pasture, and idle lands. Tremendous gains have been made in agricultural productivity over the past few decades resulting from more efficient production methods, improved machinery, greater use of fertilizers and pesticides, and more irrigation. Yet it still takes about 15 acres of grazing land to support one beef animal in cow/calf operations and as demand for beef increases, the demand for additional grazing land also increases. The gains in production coupled with Federal policy caused millions of acres to be held idle during the 1960s and early 1970s. Part of the reduction in total cropland went into pasture land. Changes in cropland use vary considerably by region with new lands cultivated in some parts and others taken out of production.

The Federal government policy in the years prior to 1972 in effect paid farmers to remove cropland from production. More recently, as demand for U.S. agricultural products increased worldwide, idle land has declined. It is likely that most cropland capacity will be utilized in the future.

New Pressures

Land use is affected primarily by its capability and by governmental regulations. About 40 percent of all U.S. land is owned by government—principally the Federal government. The majority of public lands were acquired during periods of territorial expansion and are located in the West. The government's policy has been to dispose of available public lands, and much of what has not been claimed by individuals is not that productive or desirable.

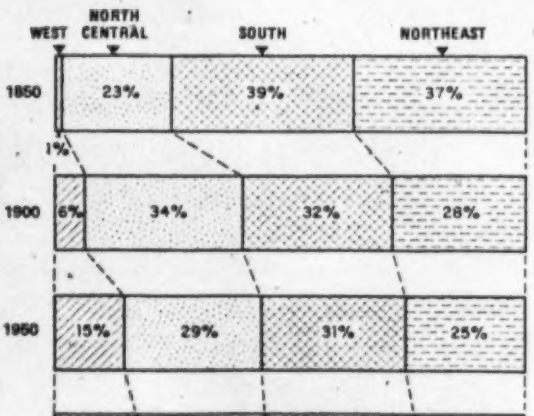
Although most U.S. land is owned privately—by individuals and corporations—regulations such as zoning laws, subdivision standards, and taxes influence land use. Historically, land use regulations have been the responsibility of local governments. Regulations were aimed at segregating inconsistent uses and preventing congestion. It was assumed that simple segregation of uses would result in higher quality environment and that the market would follow intelligent clear-cut decisions based on drawing zoning maps. It was thought that administrators would always comply with the rules, that nonconforming uses would disappear, and that local government would have the power to implement the goals.

The rapid increase in the number and affluence of Americans in the last few decades has produced such pressures on land use, especially in urban areas, that traditional attitudes toward land use are no longer appropriate. In addition, existing regulations are in many cases simply inadequate to insure a high quality environment.

Where the U.S. Population Lives

Source: Adaption of U.S. Government Printing Office, U.S. Maps GE-70, No. 1

Population Distribution in the United States by Region: 1850 to 1977



Source: U.S. Bureau of the Census

Growth Through Sprawl

The U.S. population growth of 44 percent between 1950 and 1978 has placed tremendous pressures on the housing industry. At the same time, rising incomes have meant families bought more cars, had more time and money for recreation and travel, could buy bigger homes, and even purchase second homes. Together, these factors contributed to the rapid expansion of suburbs, starting in the 1950s.

To accommodate suburban growth, thousands of acres of rural land, often good quality farmland, were converted to urban uses. Since the amount of land transferred from rural to urban use has been relatively minor in terms of total available farmland, the impact of this trend should not be exaggerated. Nevertheless, continued uncontrolled conversion could affect agricultural production in the long run. Urban areas are not self-sustaining. They must be supported by vast farmlands, pastures, forests, and estuaries. It is thus vital that our croplands, grasslands, and forests be preserved.

All too often suburban development has been unplanned and sprawling. Both the natural and visual environments have been severely damaged in many areas by such rapid haphazard growth. Homes were built on flood plains, which are inappropriate for such construction. In addition, much of the development favored large single family houses that effectively priced many families—particularly low income and black families—out of the market.

Federal, state, and local governments have influenced land use not only through regulations but also through construction of highways, transit lines, dams, airports, and sewage treatment plants. Unfortunately many projects were considered solely in terms of short-term benefits to specific interest groups or local areas and disregarded long-term environmental impact.

Planning The Future

Attitudes toward land use are changing—partly because of growing awareness of inadequate planning for and control of land use in the past and an awareness of current and future demands placed on land for food, wood, recreation and open space, and for housing and community development. Increasingly land is perceived as an eternal but finite resource to be conserved and managed rather than just a commodity to be developed and sold for maximum profit. There is growing recognition of the need to balance individual and societal interests related to land use to improve the quality of urban, suburban, and rural life.

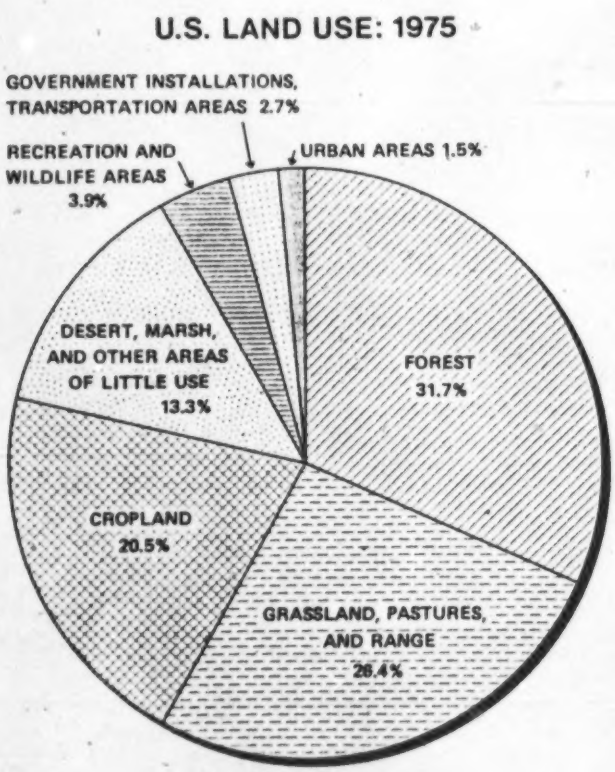
Such changes in attitude and understanding may ease the accommodation of future population growth. Between 1978 and 2000, the number of American households will increase by close to 35 percent. This growth will occur regardless of future changes in the birth rate since it is derived from people who are already born. How will the demands of these people, for housing and for recreation and open space, be met?

The response to traditional land use practices which permitted piecemeal,

rapid, profitable development is varied. Calls for limits on growth are heard from individuals, communities, and organizations. Others favor efforts to manage and control growth and still others advocate reliance on free market forces in determining land use.

Although many land use decisions are made at the local level, the success of future land use planning may depend even more on coordination of development at regional levels. Since some population growth is inevitable, unilateral decisions by certain communities to curtail development may simply push problems onto other communities. In addition, energy requirements will increasingly affect land use decisions both in terms of land need in the development of future energy sources and in housing and community development through the patterns of settlement and building codes.

By combining broad regional perspectives and local demands and constraints, land use decisions may best promote fair and efficient distribution of future development. However, land use policy will also have to resolve the U.S.'s complex, perhaps contradictory, land use goals: enhancing the present quality of life by allowing Americans full access to and use of remaining lands, versus providing for the future land needs of perhaps 40 to 50 million more people by the end of the century.


U.S. LAND USE: 1975
GOVERNMENT INSTALLATIONS, TRANSPORTATION AREAS 2.7%
URBAN AREAS 1.5%
RECREATION AND WILDLIFE AREAS 3.9%
DESERT, MARSH, AND OTHER AREAS OF LITTLE USE 13.3%
FOREST 31.7%
CROPLAND 20.5%
GRASSLAND, PASTURES, AND RANGE 26.4%

Source: U.S. Department of Agriculture

Pop Ed Amendment Passes the Senate

On August 24, the Senate passed the Education Act Amendments of 1978 authorizing Federal funds to support population education programs in elementary and secondary schools.

Passage came after a late effort to scuttle the amendment along with other special projects was defeated, 65 nays to 25 yeas. Said the pop ed amendment's chief sponsor, Sen. Robert T. Stafford (R-Vt), the program "is designed to teach American youth, who are currently behind much of the world in understanding the problem, the implications of demographic developments . . . so that they can learn for themselves the consequences to themselves, their communities, their nation, and the world, of population changes."

The next step will be the return of the bill to a conference committee where a compromise will be worked out between House and Senate versions. The principal difference is in funding: the House amendment states that 10 percent of Title 6 (Special Projects) funding must be allocated to population education; the Senate version provides $3 million for population education.

Both bills provide for (a) pop ed training programs for teachers, (b) development of materials, (c) curriculum research, (d) pop ed school programs, and (e) pop ed demonstration projects.

It is expected that the bill will be sent to the President for signing before the end of the session, and that by 1979 Federal funding will finally be available for population education activities.

Land Use Teaching Aids

"For Your Pleasure" (elementary through college level), a 4-minute cartoon that begins with a rural scene and "progresses" to urban congestion. Available for purchase ($100.00) from: Mass Media Associates, 2116 N. Charles St., Baltimore, MD 21218.

Also available for rent ($10.00) from: ZPG Film Library, ZPG, Inc., 1346 Connecticut Av. NW, Washington, DC 20036.

"Biological Catastrophes: When Nature Becomes Unbalanced" (junior high through college), two 18-minute slide/tape segments that detail the consequences of unwise use of the land. Available for rent ($5.00) from: ZPG Film Library (See above).

Also available for rent ($3.00) from: University of Cincinnati Environmental Films, Biology Department, Brodie Hall, University of Cincinnati, Cincinnati, Cincinnati, OH 45221.

Also available for purchase ($129.44) from: Center for Humanities, Two Holland Av., White Plains, NY 10603.

"Planning for People" (high school to college), an auto-tutorial unit of slides, cassette, and script in *Land Use Decision-Making Kit*. Available for purchase ($28.00) from: E-P Education Services, Inc., 800 Dixwell Av., New Haven, CT 06511, Phone: (203) 562-9967.

Murphy Joins PRB Pop Ed Program

Dr. Elaine Murphy has been named as the acting Director of Population Education at PRB. The former Director, Dr. Leon Clark is now an associate at the Government Affairs Institute.

Before coming to PRB, Dr. Murphy was Population Education Director of Zero Population Growth, Inc. She has served as an advisor on population education to the Select Committee on Population, the Maryland State Department of Education, and the Subcommittee on Population Education of the Federal Interagency Committee on Education, and as a consultant to the U.S. Office of Environmental Education.

Under Dr. Murphy's direction, ZPG became the major teacher training resource in population education. Through contacts with state departments of education in 15 states, she conducted 43 workshops from 1975 to 1978 involving 2,000 participants. She is a regular contributer to INTERCHANGE, worked closely with PRB staff on materials development, and through ZPG activities has been a major distributor of PRB population education materials.

Losing Ground *by Erik Eckholm emphasizes environmental stress and food prospects resulting from competing uses of the land. Available (cloth $9.95, paper $3.95) from W. W. Norton, 550 Fifth Av., New York, NY 10036. Also,* Worldwide Loss of Cropland, *Worldwatch Paper 24, to be published in October. Available ($2.00; 2-10 copies, $1.50 each; 11-50 copies, $1.25 each; 51 or more copies, $1.00 each) from PRB.*

PRB's New Population Handbook

Ever wonder about the difference between "total fertility rate" and "gross reproduction rate"—or for that matter, "birth rate" and "growth rate"? Find the answers in PRB's widely acclaimed new *Population Handbook*, a 64-page ready reference of population terms, concepts, and usage. The Handbook also guides the reader through the basic ideas of demography, discusses the prospects for present and future world population growth, and offers clear explanations of how to calculate demographic rates from raw data. Eminently readable, with an extensive glossary and appendix of information sources, the *Population Handbook* is a valuable data resource for anyone studying or teaching in the many fields touched by population issues.

The Population Handbook: A Quick Guide to Population Dynamics for Journalists, Policymakers, Teachers, Students, and Other People Interested in People, is available from PRB. Single copies: $2.00, 2-49 copies: $1.75, 50 or more copies: $1.50.

... *And We Have a Winner!*

In our May 1978 issue, the Pop Puzzle posed the question, "Why is it that Mexico, although it has an infant mortality rate four times that of the United States, still has an overall death rate lower than the U.S. (8 per 1,000 vs. 9 per 1,000)?"

Deborah Pomerance, Librarian and Information Specialist for Data Use and Access Laboratories, Arlington, Va., sent in the first correct answer: Mexico has a lower death rate than the U.S. because it has a higher percentage of people in the under-15 age bracket, where few deaths occur (46 percent of Mexico's population are under 15, versus 24 percent of the U.S.'s population); also, Mexico has a much lower percentage of people in the older age brackets, where more deaths occur (3 percent of Mexico's population are over 65, versus 11 percent of the U.S.'s). Hence, Mexico loses a lesser proportion of its population to old-age-related deaths than does the U.S., a difference that more than balances out its higher infant mortality and lower life expectancy.

If Mexico follows the pattern of other developed countries, in 50 years it may well have a lower birth rate, lower infant mortality, higher life expectancy—and (because of a larger population in the older ages) a higher death rate.

To Ms. Pomerance goes the Pop Puzzle "Mystery Prize," a copy of *The Children of Sanchez*, Oscar Lewis's poignant case study of the human dimensions of the Mexican demographic experience.

If lily pads in a pond double every day, and if it would take 30 days to cover the pond completely, when is the pond half full of lily pads?

Answer: on the twenty-ninth day.

The metaphor catches the urgency of Lester Brown's book, *The Twenty-Ninth Day*. The issue is the world's prospect for keeping food production ahead of demand, a question of vital immediacy in developing countries.

Brown identifies four biosystems—fisheries, forests, grasslands, and croplands—which can be upset by overuse: overfishing, denudation of forest lands, overgrazing and population pressure on the available farm land. The options, given the shortage of land, energy, and the dropping water table in many countries, include using abundant labor to increase agricultural production; initiating effective rangeland management; using less grain for livestock feed; and introducing changes in income distribution and land ownership.

The Twenty-Ninth Day: Accommodating Human Needs and Numbers to the Earth's Resources. New York: Norton, $11.95 (hardback), $3.95 (paperback).

Those interested in population education activities worldwide may want to order a booklet that introduces the pop ed program of the United Nations Fund for Population Activities. The 37-page booklet, "Population Education," begins with an overview explaining the scope of the topic and the mandates to the UNFPA by the UN Economic and Social Council and by the World Population Plan of Action, the document prepared by the nations attending the 1974 World Population Conference.

Single copies of the booklet, "Population Education," Number 11 in the UNFPA Population Profiles Series, may be ordered at $1.50 each from Unipub Inc., P.O. Box 433, Murray Hill Station, New York NY 10016 (bulk rate on request).

For more detail on such projects, one may request the "Annotated List of Population Education Projects Funded by the UNFPA 1969-1977," which contains 44 pages of one-paragraph project descriptions, classed by country, date, and sponsoring organization (WHO, ILO, FAO, UNESCO, etc.).

The list of funded activities is available from O. J. Sikes, Technical Unit on Population Education and Communication, UNFPA, 485 Lexington Avenue, New York, NY 10017.

PRB Materials and Memberships

Are you interested in rounding out your INTERCHANGE collection? Back issues of INTERCHANGE and the TEACHING MODULE are available for $1.00 each. Two or more copies are 50¢ each.

Titles include:

- "The Cost and Value of American Children," September 1977
- "American Way of Life: A Way of Death?" November 1977
- "Marriage, Divorce and Living Together," January 1978
- "World Population: Growth on the Decline" May 1978.

To order, simply send a check to the address below.

If you find INTERCHANGE interesting and useful, you would probably enjoy receiving other Population Reference Bureau (PRB) publications:

- INTERCOM—the monthly population news magazine;
- POPULATION BULLETIN—a bimonthly in-depth study of one population topic;
- WORLD POPULATION DATA SHEET—an indispensable survey of 13 variables on 162 nations;
- PRB REPORTS—periodic summaries of timely issues.

PRB Educator Members receive all the above publications, between 25 and 30 pieces a year, for only a fraction of the regular membership fee.

High school teachers (and all students) pay only $5 a year; college teachers pay just $10. The regular individual membership is $20 a year.

To join, simply send your name, address (and school affiliation if different from address), and check to: Population Reference Bureau, P.O. Box 35012, Washington, D.C. 20013.

We look forward to having you as an Educator Member!

Interchange is . . .

a publication of the Population Reference Bureau, published quarterly during the academic year. This issue was written by Dr. Leon F. Bouvier. Interchange is distributed free on request to educators and centers of population education activity. The purpose of the newsletter is to further the goal of infusing population materials into U.S. schools by: (1) presenting information on population-related issues; (2) distributing classroom materials; and (3) reviewing developments in the field of population education. Interchange depends upon an exchange of information and ideas and thus openly solicits correspondence from its readers.

The Population Reference Bureau, Inc., 1337 Connecticut Ave., N.W., Washington, D.C. 20036, is a non-profit education organization established in 1929. The Bureau is a source of information on the facts and implications of national and world population trends.

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